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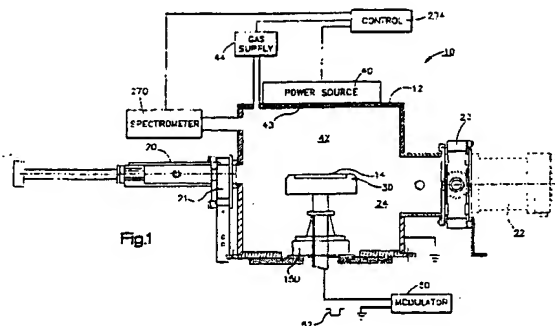
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### (54) Ion implantation control using optical emission spectroscopy

(57) Method and apparatus for use in treating a workpiece implantation surface by causing ions to impact the workpiece implantation surface. An ion source chamber (12, 220) defines a chamber interior into which a dopant material in the form of a gas is injected. A plasma of implantation material is created within the interior region of the implantation chamber. Characteristics of the ion plasma are determined from an optical analysis of the plasma using optical spectroscopy. The same ion plasma is used to supply ions used in a treatment process whereby silicon wafers (14) are doped to convert them into a semiconductor material. Data from the optical spectroscopy is stored with data from ion implantation to provide a database (280). A resulting analysis tool executing on a computer (232,274) is able to correlate additional

optical spectroscopy data with one or more implantation parameters.



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## EUROPEAN SEARCH REPORT

Application Number

EP 99 30 3302

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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Y	* column 2, line 21 - line 57 *  * column 4, line 5 - line 9 * * column 4, line 66 - column 5, line 13 * * column 5, line 41 - column 6, line 14 * * column 11, line 18 - line 25 *	1-10, 12-16	
Y	WHITE D A ET AL: "SPATIAL CHARACTERIZATION OF WAFER STATE USING PRINCIPAL COMPONENT ANALYSIS OF OPTICAL EMISSION SPECTRA IN PLASMA ETCH" IEEE TRANSACTIONS ON SEMICONDUCTOR MANUFACTURING, US, IEEE INC, NEW YORK, vol. 10, no. 1, February 1997 (1997-02), pages 52-61, XP002924118 ISSN: 0894-6507 * page 52, right-hand column, paragraph 3 * * page 54, left-hand column, paragraph 2 - paragraph 3 *	1-10, 12-16	
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The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>14 December 2000</b>	Examiner <b>Aguilar, M.</b>
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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